REMARKS

Claims 1-3 and 10-11 are presently pending in the application.

Claim 1 has been amended to recite that the counterflow gas is pure argon and that the sample gas is a mixture of pure helium and up to 50% argon, which is supported in original claim 1. Claim 2 has been amended to eliminate the redundancy. Claims 4-9 have been canceled. Finally, claims 10-11 have been added, which recite that the mixture contains 0.1 to 50% argon or only helium, which are both supported in original claim 1. No new matter has been added by these amendments, and entry is respectfully requested.

Double Patenting Rejections

In the Office Action, the Examiner has rejected claims 1-6 and 8 on the grounds of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7,067,800. The Examiner argues that while the conflicting claims are not identical, the gas to be analyzed in the patent in hydrogen or oxygen and the gas to be analyzed in the present application is helium. The Examiner argues that the methods use the same idea of utilizing a mixture of argon and the gas to be analyzed as a counterflow gas with specifically defined ratios of flow rates of the gas to be analyzed and the counterflow gas.

The Examiner has also provisionally rejected claims 1-6 and 8 on the grounds of obviousness-type double patenting as being unpatentable over claims 1-7 of co-pending U.S. Patent Application Publication No. 2003/0209664 for the reasons set forth above. Applicants note that the '664 publication has issued as the '800 patent.

Applicants respectfully traverse these rejections as follows. The Examiner argues that the claims of the '800 patent recite that the counterflow gas is a mixture of pure argon and the gas to be analyzed, as claimed. In contrast, instant clam 1 and the claims which depend therefrom recite a method for analyzing helium or a helium/argon mixture which utilizes pure argon (not a gas mixture) as the counterflow gas. Accordingly, Applicants respectfully submit that the present claims would not have been obvious based on claim 1 of the '800 patent (or based on claims 1-7 of the '664 publication) and reconsideration and withdrawal of the double patenting rejections are respectfully requested.

Rejection Under § 112, Second Paragraph

The Examiner has rejected claims 1-6 and 8 under 35 U.S.C. § 112, second paragraph, as being indefinite. Regarding claim 1, the Examiner argues that three different embodiments, requiring different experimental set-ups, are recited, and that these embodiments are restrictable as different species. The Examiner requests clarification as to which specific embodiment is recited. By this amendment, claim 1 has been amended to positively recite a method which uses pure argon as a counterflow gas and a mixture of helium and up to 50% argon as a gas to be analyzed. Accordingly, Applicants respectfully submit that only one embodiment is being claimed.

The Examiner further argues that claim 1 recites two types of helium gas: one with impurities and one without impurities, and that it is not apparent if these two types of helium gas are obtained from the same source or from different sources. Claim 1 recites only one type of helium gas, one which contains impurities, and thus is it respectfully submitted that claim 1 is definite.

Finally, regarding claim 6, the Examiner argues that the claim should be recited in a descriptive way, rather than by referring to a drawing, and further that it is not clear what the system and lines are, where they are located, and if the are connected to the sources of pure helium and pure argon. Claim 6 has been canceled by this amendment, rendering the rejection moot.

For these reasons, reconsideration and withdrawal of the § 112, second paragraph rejection are respectfully requested.

Prior Art Rejections

The Examiner has rejected claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable over EP 1154268 of Ketkar et al. ("Ketkar") in view of U.S. Patent No. 6,653,144 of Nishina et al. ("Nishina"). The Examiner argues that Ketkar teaches a method for operating an ion mobility spectrometer used to detect trace impurities in gases which eliminates interference from the bulk inert gas by quenching bulk inert gas ions during analysis when mixing the bulk gas (e.g., N_2) with the reagent gas (e.g., Ar). Ketkar allegedly teaches that a drift gas is conventionally a

purified sample gas, and the Examiner argues that adding Ar to a sample gas or a drift gas quenches N_2 ion clusters and allows analyzing impurities in N_2. Pure Ar is allegedly used as the drift gas in one embodiment. However, the Examiner acknowledges that Ketkar does not teach a method for detecting impurities specifically in a helium gas with various combinations of helium and argon used as a sample and drift gas, as claimed.

However, while acknowledging that Nishina is a translation from Japanese and not always clear, the Examiner argues that Nishina teaches a method for detecting ultrasmall quantities of impurities in He gas by mixing a purified sample gas with Ar gas in an amount of 0-50% and using different combinations of He and Ar as sample and drift gases.

Therefore, the Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time of the invention to expand Ketkar's method to detect trace impurities in helium, as taught by Nishina, because both references allegedly demonstrate improving detection capabilities and selectivity of ion mobility spectrometry by adding a reagent gas (argon) to a sample gas (helium) in an amount of up to 50% argon and using pure helium, pure argon, or a mixture thereof as a drift gas because both references allegedly demonstrate that formation of ion clusters of the bulk gas (helium) with reaction argon gas shifts ion mobilities of the bulk gas and thus allows detecting trace impurities which are otherwise hindered by the ions of the bulk gas. Applicants respectfully traverse this rejection as follows.

Nishina teaches a method for analyzing trace impurities in gas using a combination of two instruments: a gas chromatograph and an APIMS (Atmospheric Pressure Ionization Mass Spectrometer). In this set-up, the elution product of a gas chromatograph column is combined with an Ar or Ar/He mixture, for example, and then fed to the APIMS (Nishina, col. 3, lines 34-49). An APIMS must operate at a high flow (usually at about 1 liter/min), which is not compatible with the elution from the gas chromatograph column. Accordingly, the sample eluting from the gas chromatograph is diluted with an inert gas (such as Ar, He, or a mixture thereof) to increase the flow rate and provide for proper operation of the APIMS (Nishina, col. 1, lines 15-26). Although an APIMS has an ionization zone at atmospheric pressure, the separation zone is under vacuum, and the ions are separated according to their charge/mass ratio at a pressure of about 10^{-6} bar.

As described in the present application (see paragraph [0008] of the application publication), an IMS instrument contains a separation zone which is kept at atmospheric pressure. Nishina does not teach or suggest a drift gas being used at atmospheric pressure, or somewhat higher, as in an IMS instrument, nor a counterflow of argon being used at atmospheric pressure. Accordingly, there would have been no motivation to combine Nishina, which utilizes an instrument having a separation zone under reduced pressure, with Ketkar, which utilizes an IMS, having a separation zone under atmospheric pressure. Also, there would have been no reasonable expectation of success in combining Nishina, which teaches the analysis of helium, with Ketkar, which teaches the analysis of nitrogen and oxygen. These gases are completely different from one another, and the methods described for their analysis by the cited references are also completely different. Accordingly, even the proposed combination of Ketkar and Nishina would not render the present claims *prima facie* obvious, and reconsideration and withdrawal of the § 103(a) rejection based on Ketkar in view of Nishina are respectfully requested.

Finally, the Examiner has rejected claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Ketkar in view of Nishina and further in view of U.S. Patent No. 5,194,233 of Kitahara et al. ("Kitahara"). The Examiner acknowledges that even the proposed combination of Ketkar and Nishina would not specifically disclose a purifier based on nickel. However, the Examiner asserts that purification of helium and argon gases based on nickel is well known in the art, as allegedly taught, e.g., by Kitahara. Accordingly, the Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time of the invention to purify helium or a helium/argon mixture using nickel as one of the components of metal alloys, because Kitahara, for example, teaches efficient purification of rare gases, including helium, using getters which comprise nickel along with other metals. Applicants respectfully traverse this rejection as follows.

Claim 8 has been canceled by this amendment, rendering this rejection moot. Accordingly, reconsideration and withdrawal of the § 103(a) rejection based on Ketkar in view of Nishina and Kitahara are respectfully requested.

In view of the preceding Amendments and Remarks, it is respectfully submitted that the pending claims are patentable distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,
Luca Pusterla, et al.

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(Date)

SANDRA M. KATZ
Registration No. 51,864
AKIN GUMP STRAUSS HAUER & FELD LLP
One Commerce Square
2005 Market Street, Suite 2200
Philadelphia, PA 19103-7013
Telephone: 215-965-1200
Direct Dial: 215-965-1344
Facsimile: 215-965-1210
E-Mail: skatz@akingump.com

SMK/rc